

**REYNA DEL CARMEN MARTÍNEZ RODRÍGUEZ & LILIA BENÍTEZ
CORONA**

FACTORS THAT ENHANCE DIDACTIC IMPLEMENTATION OF HUMAN DEVELOPMENT COURSES IN POLYTECHNIC UNIVERSITIES ENGINEERING STUDENTS

Abstract

This paper presents partial results of the analysis of the didactic implementation of transverse subjects focused on the human development into the Competency-Based Education Model (CBEM) of the Polytechnic Universities' subsystem. A descriptive study was designed through a questionnaire to identify strengths and weaknesses in the teaching of these subjects from the perception of engineering students.

It was detected, as an area of opportunity, the need to enrich intrapersonal and interpersonal skills in students through the development of activities that they reflect on different cultures and the importance of relating theoretical content with real situations and the use of technologies. The contributions of Delors (1996), Blanco (2006) and Ornelas (1995) were picked in order to show the need to enrich the comprehensive educational training through enriching educational process implementation into Polytechnics Universities' subsystem.

Key words: didactic implementation, human development and engineering students

Introduction

The arrival of new technologies at the beginning of the 21st Century, set new challenges in the social, technological, cultural, economic and educational contexts. New policies around improving the educational quality of higher education have been established in Mexico. Increased coverage, facilities, equipment and educational models focused on Competency-Based Education were established to support the needs of both students and different business and service sectors.

The National Polytechnic Institute has addressed the technological higher education in Mexico since the 1930s. It has been transformed its curricula in the management and the financial issues. As an example, we can observe the National System of Technological Higher Education integrated by the federal and decentralized Technological Institutes, Technological Universities and Polytechnic Universities.

Since 2001, within the Polytechnic Universities' subsystem there are careers on Competency-Based Education Model (CBEM). In all curricula that are offered there are six subjects focused on human development in order to strengthen the comprehensive educational training of engineering student.

These subjects include: thinking skills, ethics, values, harmonious and productive coexistence, emotional intelligence, leadership skills and collaborative work among others. However, the complexity of the content involves not only last in teaching a subject, but must permeate all contents in the form of values, principles

and attitudes that are part of the institutional learning environment in which they grow daily.

The presence of subjects in the humanities area in the careers offered by Polytechnic Universities is justified by the need to provide comprehensive educational training. Nevertheless, there is not an official document to substantiate precisely what the generic and transferable skills are that these subjects contribute to develop. Existing documents provide only specific competencies by training course for students of every career should develop (CUP, 2005).

Moreover, subject manuals are guide tools that guide the teacher in the learning activities to be carried out at each stage of the program, identifying learning outcomes but not generic competencies. Furthermore, the vague connection between the generic competencies to be developed in each humanities subject, learning activities and assessment of learning outcomes, creates insecurity among professors and students about what is necessary to include such content (Blanco, 2009).

For this reason, some students and professors downplay the importance of these subjects and do not articulate their potential with other ones. Although through the reasoning and objectives of these manuals we can detect their presence, this lack of clarity creates the need to identify and found what the powers are in order to strengthen human development courses for the comprehensive educational training in engineering students.

Therefore, the question arises:

What are the aspects in the didactic implementation on the human development subjects that enhance the comprehensive educational training of engineering students?

Didactic implementation and the comprehensive educational training in college students

The Underministry of Technological Higher Education (2009) points out that it is possible to think on didactic implementation as the construction of a road that both professors and students will follow in order to develop professional competencies established in the curricula of a particular career, considering that the meaning of implement leads to build, do something, build a platform, establish and organize a series of activities in time and space.

From the above we underline that didactic implementation is organizing a set of ideas and activities that allow developing an educational process with meaning, significance and continuity. This can build a model or pattern, with different variants, can address different situations and problems that teachers face in their teaching, in a coherent and orderly manner (SEP, 2009).

This process implies an analysis and an organisation of the educational contents. It also involves determining purposes, intentions and educational goals to achieve, establish and sequence activities that enable the achievement of the objectives established. Coordinating these activities in time and space. That means establishing a comprehensive action plan and having clear educational plan that will guide the entire process.

The main aspects to consider are: analysis and organisation of contents, a clear concept of learning, organization of teaching and learning activities and the establishment of evaluation criteria.

For a student to build learning is necessary in the design of teaching strategies that the teacher fosters the student perform activities, search and analysis of information. For expression skills: speak, write, create ideas, and relate ideas orally and in writing. For communication skills: discuss, argue, explain, and support a certain point of view.

Collaborating through collective participation activities. Creating in order to produce original texts, develop projects, design and make various operations to solve problems.

The educational intervention has a before and after which are essential parts in any educational practice, the planning and evaluation of educational processes are an inseparable part of the teaching performance in the classroom, which are closely linked planning, didactic implementation and evaluation (Zabala Vidiella, 1995, p. 12).

In the first stage of the research we focus on the moment in which the teacher interacts with the students in order to know their perceptions. In this sense, the learning activities are selected, organised and structured on a basis of three stages:

- Opening activities: in which the professor promotes a climate of interest on the topic, establishes a link between previous experiences and the new situation from concrete experiences, gives the opportunity to observe and analyse a phenomenon; invites to explore unfamiliar situations and make and take questions.
- Development activities: here is intended that the professor mediates the content with the capabilities of students through the development of different strategies, promotes management theoretical elements, develops charts, graphs, diagrams, maps, etc. In order to analyse and infer rules or principles and obtain results.
- Closing activities: Analysing results by linking what the students learn to futures issues. Articulating what they learn to aspects of their daily life. Applying what they learn to solve problems in different situations.

Identifying general aspects indicated by the SEP realizes the complexity of a process that aims to promote comprehensive educational training for students. In this regard, the Delors Report (1996) provides learning to live together and work on common projects as one of the axes in comprehensive educational training.

It is framed as one of the most important challenges of the 21st century due to the destructive power that is lived such as insecurity, natural disasters, wars and diseases. This is seen on a smaller scale in the school and family context. This results in mistrust of self and others in students. So it is important to encourage students to learn to discover the other gradually. Identifying that there are differences with the others, but these can become interdependencies, because ones and the others share common spaces

Mexico is facing a big problem of educational quality according to Ornelas (1995, p. 372), who notes that it is revealed in poor school results, the irrelevance of the content and practice of improper teaching methods for obtaining knowledge. Sometimes poor quality does not question the purpose of the content or purpose of the career. This is exacerbated for the future since Mexico is currently facing international challenges that require the country to accelerate its development, which means more pressure to the education system.

In this context of pressures and uncertainty De Miguel (2006, p. 13) notes that the scenarios and methodologies of university education must undergo a deep renewal. From the classic didactic approaches focused on the classroom and in the activity of the professor, now it important advocates for a learning concentrated in the autonomous activity of student, however this transition is complicated.

Santos (2003) analyses the knowledge of professors. It occurs through a process of internalization of experiences from the reflection in and on the practice, so in addition to being full-time professors it is needed researching and reflecting with respect to the practice itself, allowing the student improve from the contextual conditions in which they are.

For this reason, research is not limited only to deepen as a specialized scientific knowledge, it also allows and leads to reflection on practice directly linked to the professor function allowing building a commitment to teaching action itself.

Given this complexity come new challenges and needs in technological higher education focused mainly on developing a comprehensive educational training, which not only provides knowledge but also develops skills, attitudes and values.

One of the main objectives in higher education is to awaken the student's interest that in becoming a better person through the implementation of teaching strategies that motivates them to reach their goals.

Methodology

It was designed exploratory methodology – transversal descriptive in order to know perceptions in a group integrated by 105 students from different careers who took human development courses from September to December 2013. Babbie (2000) mentions that exploratory studies are in order to: a) Acquiring more information about the object of study; b) Testing the feasibility of a larger project, in this sense the presented results are the first part of a research project. The sample selection was made through probability sampling, which provides useful descriptions of the total population. A questionnaire to the categories recommended by the SEP on the process of didactic implementation in technological higher education with a Likert scale of four items was applied: 1) Little importance, 2) moderately important, 3) important, 4) essential for the comprehensive educational training, finally we also integrated two open questions.

Results

On one hand, students' perceptions reflected those factors that stimulate their comprehensive educational training. On the other hand, there are aspects that should be strengthened into didactic implementation process. In order to validate the questionnaire we obtained an Alpha Cronbach of .83.

With respect to the factors that facilitate education's students on the assessments conducted by professors it is necessary: Taking into account all the activities during the course and publicize their rates on time – 89%. Presenting organised classes – 87%. Showing commitment – 87.8%. Being accessible to provide help – 86.6%. Explaining clearly – 85.4%. Solving doubts – 85.4%. Fulfilling agreements generated at the begging of courses – 85.4%.

Lower percentages indicated the aspects that need to be strengthened to improve learning environments: Using technology creatively – 52.4%. Linking theoretical contents to real life – 55%. Presenting well-prepared classes – 55.6%. Getting involved in activities – 56%. Using different strategies to promote knowledge about several cultures – 52%.

Discussion

The student perceptions of the learning environment are an important factor to evaluate the quality of educational interventions. In Polytechnic Universities, the teacher-centred didactic approach is still predominant in most engineering, in this sense the results reveal the importance for students to interact with their teachers and peers in a supportive environment to foster their comprehensive development.

Consequently, it is necessary to be aware of the strengths that detect students during our performance as teachers. It is the case of the evaluation process as the indicator in the development of their learning. Students noted the need to address them individually and provide them opportunities for self-awareness, personal growth and decision.

The central objective of education is to produce students with initiative and determination, who can work jointly with their peers without ceasing to develop their individuality. For this reason education should integrate the intellectual, affective and interpersonal skills, in order to move to a student-centered education that requires use of non-traditional, diverse resources close to the reality of students issues that were identified as weaknesses in results.

Conclusions

In this first stage of research, students' opinions helped identify factors that promote comprehensive education training: They admitted the need to have committed professors, willing to prepare engaging lessons and provide support and recognition to both students as people rather than just focusing to comply with content paying no attention on needs of the whole group.

The results show the need for transforming the role of the professor as a mediator. It requires that professor performance is more focused on learning than teaching, so its attention is directed to the design of learning environments rather than to only cover content, further monitoring and constant support to students. Complex issue that exists in the polytechnic universities, since the change from traditional teaching to a competency-based education has generated strengths and insecurities to break the paradigms in which professors were trained.

Therefore, it is necessary to realise that the organisation of teaching in university implies favouring the development of the construction of student learning to make it possible to relate it to the logic of the several disciplines into the employment context in which students will be inserted as well as into their day-to-day context.

The idea above implies that the professor should incorporate different methodological choices designed to promote higher-level cognitive processes and creative thinking processes, including those cultural contents through different activities in which can innovate by using new technologies. Only in this way

university teaching can be formative to have a significant impact on the comprehensive educational training of the student.

The development of didactic and human capabilities of the professor are necessary for change within the classroom is real and not only be reflected in educational discourses, consequently the importance that professors are able to plan and create active learning environments with the use of technologies of information, encourage students to acquire and build content and knowledge through study and bonding with students' experience.

It is advisable while a professor is in front of a group: understanding that he is working with people; changing the linear thinking for flexible thinking because all individuals are different and complex; facilitating the identification of obstacles or problems that arise in the implementation of projects or other instrumented activities in the didactic implementation in order to promote learning beyond a professional sphere. These should be useful to improve the quality of life at the same time they should have and positive impact on the comprehensive educational training of students.

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Dra. Reyna del Carmen Martínez Rodríguez
Full- time research teacher
Polytechnic University of Pachuca
México
reyna@upp.edu.mx

Dra. Lilia Benítez Corona
Full- time research teacher
Polytechnic University of Pachuca
México
lybeco@upp.edu.mx